



Fourth GAIN World Conference

Paris, France
June 14-15, 2000

Benefits Obtained From a FOQA Program

Capt. Jacques Verrière
FOQA Manager
Air France



Data Monitoring in Europe

- **Data monitoring programs have been implemented in major European airlines (BA, AF, KL, TAP , etc) for several decades.**
- **Most programs include some kind of crew feedback.**
- **Cockpit crew unions are involved in program implementation.**



Data Monitoring at Air France

- **1974 : Union agreement signature leading to first implementation of systematic flight data monitoring.**
- **Today : all airplanes (225) have monitoring equipment (QAR, DAR or EQAR).**
- **Figures for 1978 : 500 tapes/optical disks processed each week, 220 000 legs have been analyzed (78 % of all legs flown).**



Data Monitoring at Air France

- **Agreement with cockpit crew unions :**
 - confidentiality,
 - conditional immunity,
 - FOQA safety committee analysing most significant events, involving unions representatives, meeting every 2 months,
 - crew feedback system (through written reports and/or interviews),
 - FOQA bulletin distributed to cockpit crews.



External Relationships

- **Relationship with authorities (DGAC) :**
general information, FOQA committee
annual report (no information related to
specific events).
- **Relationships with alliance and partner
airlines :**
 - general exchange of information about FOQA
implementation,
 - some partner airlines use AF ground analysis
system on a commercial basis.



Ground analysis system

- **The current system has been developed internally. Need for a new system for :**
 - **increased capacity for electro-optical disks processing,**
 - **better productivity (for analysis).**
- **A new system (SFIM) is on order, delivery fall 2000.**



Why does Air France conduct a FOQA program ?

- **Operational risk management is the driving motivation.**
- **Additional benefits :**
 - **maintenance (engine and A/C performance monitoring, troubleshooting),**
 - **cost control (check of ATC enroute fees, fuel monitoring).**



FOQA and flight safety management

- **FOQA has the potential to give reliable information in terms of events visibility.**
- **Crew feedback is still essential to understand factors leading to operational errors and deviation.**
- **FOQA is unable to detect some safety related events (ex. : runway incursions).**



FOQA events

- **FOQA is very efficient at detecting events related to landing accidents such as :**
 - **non stabilized approaches, (detected by IAS, bank angle, rate of descent, localizer and glide slope deviations, flaps setting, etc),**
 - **excessive touchdown distance,**
 - **excessive pitch attitude at touchdown,**
 - **dual flight controls inputs (on Airbus A320, A340 family).**



FOQA events

- **FOQA may detect some events related to potential CFIT, midair collisions and losses of control in flight, such as :**
 - **GPWS/EGPWS warnings and alarms,**
 - **TCAS events,**
 - **altitude deviations,**
 - **low speeds (stick-shaker),**
 - **low approaches,**
 - **CAS above 250 kt at low altitudes.**



Outcomes from FOQA : statistics

- **Trend analysis (ex. : rushed approaches) per fleet and airports.**
- **Assessment of safety related measures effectivity (ex. : 250 kt at low altitudes).**
- **Alerts on problems related to particular airports (ex. : SFO, MRS) or fleets.**
- **Specific analysis linked to incident investigations.**

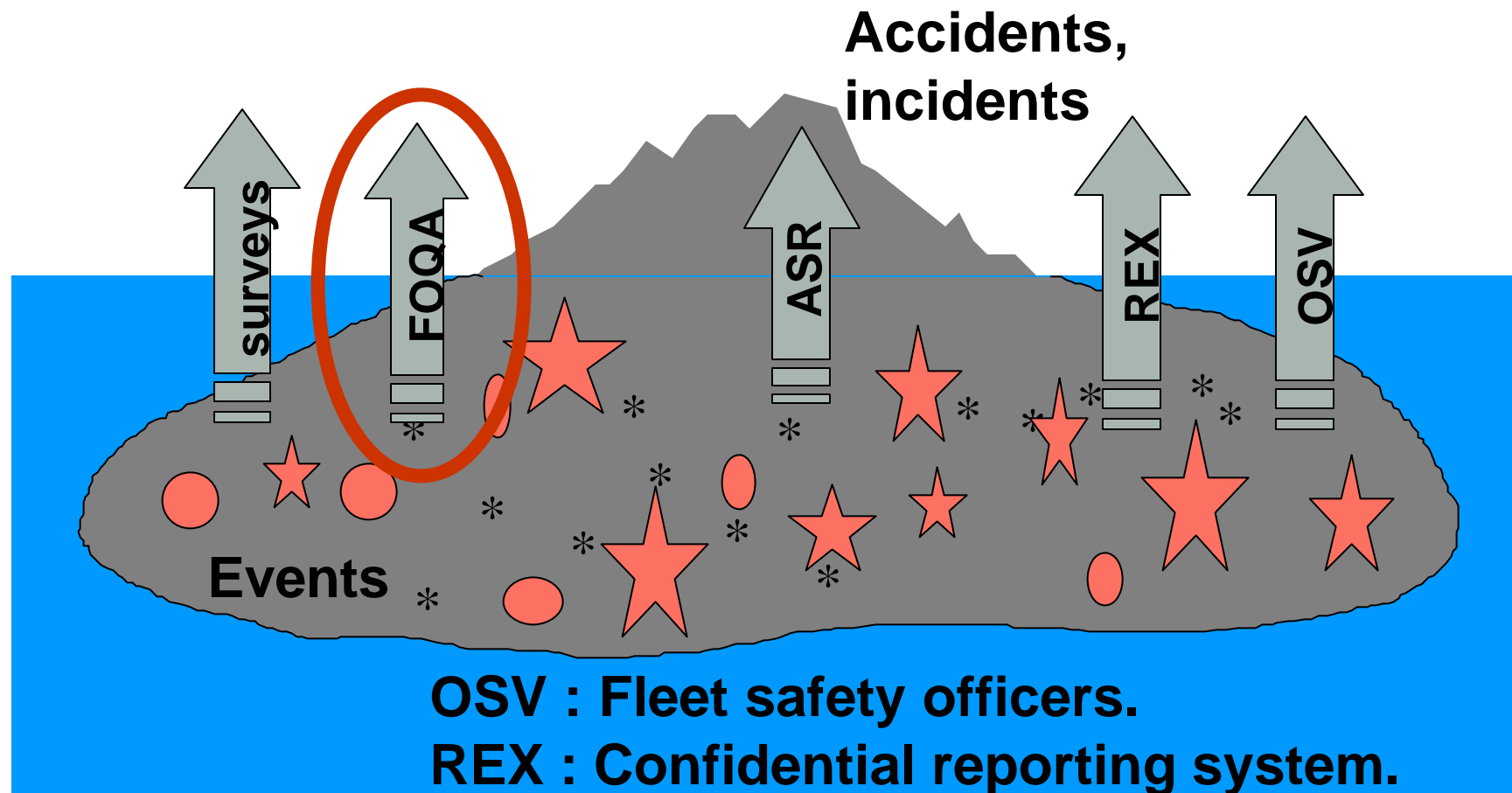


Outcomes from FOQA : selected events analysis

- **Selected events are analysed by the FOQA safety committee.**
- **Analysis (including crew feedback) leads to corrective actions (procedures, training, documentation, etc).**
- **Publications : FOQA bulletin, case studies for CRM training courses.**



FOQA : one component of a multiple channel feedback system





FOQA and other feedback channels

- **The combined use of FOQA with other channels is very efficient :**
 - **Better events visibility by cross detection (reporting and monitoring),**
 - **FOQA adds «hard» data to crew reports,**
 - **Information may be used to improve events detection by FOQA.**



A selected example : TCAS resolution advisories

- **TCAS RA are detected by FOQA using TCAS data : evaluation of crew reporting.**
- **FOQA gives quantitative data about crew response to RA : training improvement.**
- **Altitude excursions following RA should be detected : improvement of FOQA software detecting altitude excursions.**



Sharing FOQA data

- **Data about generic events such as detection algorithms.**
- **Qualitative data : airports where rushed approaches occur more often, specific problems related to some fleets.**
- **Sharing information about corrective actions and their efficiencies.**



Sharing FOQA data

- **Formal sharing of data about isolated events may be difficult due to anonymity. Data exchange protocols require the involvement of cockpit crew unions.**